



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/598,951	07/13/2007	Shelley D. Minter	SLU 03-022 (4556.8)	2480
321	7590	03/26/2009	EXAMINER	
SENNIGER POWERS LLP 100 NORTH BROADWAY 17TH FLOOR ST LOUIS, MO 63102			KALAFUT, STEPHEN J	
			ART UNIT	PAPER NUMBER
			1795	
			NOTIFICATION DATE	DELIVERY MODE
			03/26/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspatents@senniger.com

Office Action Summary	Application No. 10/598,951	Applicant(s) MINTEER ET AL.	
	Examiner Stephen J. Kalafut	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 January 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,7,11,13,14,17,34,38,61,62,64,68 and 70 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 61,62,64,68 and 70 is/are allowed.
- 6) ☒ Claim(s) 1,2,4,7,11,13,14,17,34 and 38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 1795

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 23 January 2009 has been entered.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 2, 4, 7, 11, 13, 14, 17, 34 and 38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The alternative section (i) in claim 1 recites that at least one of the anode and cathode is formed for the flow of fuel therein. This is confusing because normally an anode would contact fuel, but a cathode would contact oxidant. Claims 2, 4, 7, 11, 13, 14, 17, 34 and 38 depend from claim 1, and would thus likewise be indefinite.

Claims 1, 2, 4, 7, 11, 13, 14, 17, 34 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Minter *et al.* (US 2005/0095466) in view of Dyer (US 5,094,928).

Minter *et al.* discloses a biofuel cell (paragraph 0017) that includes a biocathode and bioanode that each include the presently recited materials, including electron conductors (paragraphs 0071-0075 and 0122), electron mediators (paragraphs 0077-0080 and 0124-0127), electrocatalysts (paragraphs 0082-0085 and 0129-0130), enzymes (paragraphs 0087-0088 and

Art Unit: 1795

0132-0135), and enzyme immobilization materials (paragraphs 0090-0108), such as those with a micellar or reverse micellar structure (paragraphs 0027, 0097-0099 and 0137). Minter *et al.* does not disclose at least one electrode having a width of 200 microns with an irregular topography capable of inducing convective flow. Minter *et al.* discloses appropriate sizes for pores and transport channels (paragraph 0094). Thus, determining an optimal size for the overall electrode would be within the skill of the artisan. Dyer discloses fuel cell electrodes with an irregular surface, in order increase power density with a compact size (column 2, line 65 through column 3, line 2). For this reason, it would be obvious to modify the electrodes of Minter *et al.* to have irregular surfaces, as taught by Dyer.

Claims 1, 2, 4, 7, 11, 13, 14, 17, 34 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Minter *et al.* (US 2005/0095466) in view of Mercuri (US 6,517,694).

Minter *et al.* discloses a biofuel cell (paragraph 0017) that includes a biocathode and bioanode that each include the presently recited materials, including electron conductors (paragraphs 0071-0075 and 0122), electron mediators (paragraphs 0077-0080 and 0124-0127), electrocatalysts (paragraphs 0082-0085 and 0129-0130), enzymes (paragraphs 0087-0088 and 0132-0135), and enzyme immobilization materials (paragraphs 0090-0108), such as those with a micellar or reverse micellar structure (paragraphs 0027, 0097-0099 and 0137). Minter *et al.* does not disclose at least one electrode being formed for flow therein for producing electrical current. Mercuri discloses fuel cell electrodes (110) that include internal channels (20), in which a reactant would flow. These channels increase the residence time of gas-catalyst contact

Art Unit: 1795

(column 10, lines 26-31). For this reason, it would be obvious to modify the electrodes of Minter *et al.* to have internal channels in which a reactant may flow, as taught by Mercuri.

Claims 61, 62, 64, 68 and 70, for reasons of record, are allowed.

Applicant's arguments with respect to claims 1, 2, 4, 7, 11, 13, 14, 17, 34 and 38 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen J. Kalafut whose telephone number is 571-272-1286. The examiner can normally be reached on Mon-Fri 8:00 am-4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Application/Control Number: 10/598,951

Page 5

Art Unit: 1795

/Stephen J. Kalafut/

Primary Examiner, Art Unit 1795